Code No: 111AD

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year Examinations, June - 2015
ENGINEERING PHYSICS
(Common to all Branches)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a)	Write short notes on properties of ionic crystals.	[2M]
b)	What are the main conditions for Bragg's law?	[3M]
c)	State and explain about de Broglie's hypothesis.	[2M]
d)	Explain origin for energy bands.	[3M]
e)	Define polarizability, dielectric constant and susceptibility.	[2M]
f)	Explain Meissner effect.	[3M]
g)	Discuss briefly about double refraction.	[2M]
h)	Define Numerical aperture and acceptance angle	[3M]
i)	Write short notes on direct and indirect band gap semiconductors.	[2M]
j)	Explain quantum confinement in nano-materials.	[3M]

PART-B

(50 Marks)

2.a) Calculate cohesive energy of a diatomic molecule.
b) Discuss about the structure of NaCl with neat diagram.
c) Explain salient features of miller indices. [3+4+3]

OR

3.a) Define unit cell, space lattice, lattice parameters.
b) Prove that fcc is closely packed when compared to simple cube and bcc structures.
c) Estimate number of Schottky defects at a given temperature. [3+4+3]

4.a) Derive Schrodinger time independent wave equation.
b) Write the properties of matter waves.
c) Explain physical significance of 'ψ'. [6+2+2]

OR

5. Discuss in detail about properties of M-B, B-E and F-D statistics. [10]

6.a) Derive expressions for electronic and ionic polarizations.
b) Write short notes on piezoelectricity. [6+4]

OR

7.a) Define permeability, magnetic field induction and magnetic field intensity.
b) Discuss about Bohr magneton.
c) Explain domain theory of ferromagnetism and on the basis of this theory how do you explain hysteresis behavior of ferromagnetic materials. [3+3+4]

8.a) Discuss about Newton's ring experiment and describe the procedure to calculate the radius of curvature of the lens.
b) Discuss the characteristic features of lasers light. [6+4]

OR

9.a) Describe construction of fiber optic cable with the help of block diagram.
b) Explain attenuation in optical fibers. [6+4]

10.a) Estimate the carrier concentration in n-type semiconductor and also find the position of Fermi level in n-type semiconductor.
b) Discuss about the factors affecting the architectural acoustics and suggest the remedies. [5+5]

OR

11.a) Discuss about the origin for nanotechnology.
b) Explain synthesis of nanomaterials by sol-gel technique. [4+6]

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